

EXHIBIT 11

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## California-Great Basin

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REGION 10

## Past Discussions

### Authority to Implement Study

Section 102 of Public Law 99-546 authorizes the Secretary of the Interior to undertake a cost allocation study of the CVP. As approved by the President on October 27, 1986, Section 102 provides in pertinent part that: “(2) The Secretary of the Interior is authorized and directed to undertake a cost allocation study of the Central Valley Project, including the provisions of this Act, and to implement such allocations...”

### Cost Allocation vs. Cost Recovery

The primary purpose of the Cost Allocation Study is to develop appropriate cost allocation factors that are used to assign CVP construction costs among authorized project purposes: flood control, navigation, water supply (irrigation, M&I, and refuge), power, fish and wildlife, water quality, and recreation. The cost allocation process is independent of cost recovery, which focuses on repayment of those project costs that are deemed to be reimbursable by project water and power

Once costs are allocated across purposes, the issue of cost recovery and repayment will be addressed as part of the Cost Allocation Study. The cost recovery analysis will entail estimating total reimbursable costs of the project and identifying which project beneficiaries will be responsible for repayment pursuant to Reclamation law and policy.

## Interim vs. Final Cost Allocation

The current cost allocation study represents the final cost allocation for CVP facilities subject to the 2030 repayment requirement.

## Cost-Allocation Methodology

The Separable Costs Remaining Benefits (SCRB) method for allocating costs of multi-purpose projects was adopted for use by Reclamation in 1954, is a widely accepted method used by water resource agencies, and was used in the 1956, 1960, 1970, and 1975 CVP cost allocations. Given the history of Reclamation policy supporting the SCRB method for cost allocations, the SCRB method will be used for the updated CVP cost allocation. The SCRB method is based on determining a justifiable investment for each authorized project purpose, and it is defined as the lesser of either: (1) the benefits ascribed to the purpose; or (2) the cost of the most economical single purpose alternative project that would generate the same benefits as the multipurpose project.

## Facilities Included

The Cost Allocation Study will confirm or adjust allocations for CVP facilities in the following divisions or units:

- Shasta and Trinity River Division;
- Friant Division;
- Canals Unit, Sacramento River Division;
- Folsom Unit, American River Division;
- Delta Division;
- San Luis Unit, San Felipe Division;
- San Joaquin Division; and
- New Melones Unit, Stanislaus Division.

With exception of the San Felipe Division, the Safety of Dams program improvements, and potential CVP Improvement Act-authorized projects and facilities, all current CVP facilities are subject to the 2030 repayment obligation. The allocation for facilities with post-2030 repayment

obligations would incorporate the updated allocation resulting from the study, and those costs would be recovered over a separate repayment period.

## Interest Rate

A 3.25 percent federal interest rate will be used in this CVP cost allocation study. This rate is consistent with rates used in past CVP cost allocation studies and complies with Section 80(b) of Public Law 93-251, requiring a December 1968 discount rate for facilities authorized prior to January 1969. The rate at that time was 3.25 percent.

## Base Year

The base year for the Cost Allocation Study will be 2013. All estimates of project benefits and alternative costs will reflect 2013 average annual price levels. FY 2013 financial statements will be used.

## Period of Analysis

PEC 01-02 states: "The period for estimating benefits and costs used in the cost allocation process will be the same as that used in project formulation and evaluation which is the lesser of the economic life of the project, or 100 years beyond the initial date of service (P&G 1.4.12)." Given the economic life of the project is expected to exceed 100 years, this final allocation will utilize 100 years beyond the initial date of service as the period of analysis.

## Initial 50-Year Analysis and Historic Benefits

Reclamation will streamline the Cost Allocation Study methodology by initially evaluating the benefits associated with a specific CVP purpose for 50 years. Should initial benefits exceed the Single Purpose Alternative (SPA) costs for that purpose, then additional economic benefit analyses would not be needed.

As outlined in Reclamation's Directives and Standards for Project Cost Allocations (PEC 01-02) and pursuant to the Federal Principles and Guidelines, benefits are measured from a national perspective, as opposed to a localized increase/improvement to society.

## Water Year Types

An estimate of the range of benefits spanning critical, dry, below normal, above normal, and wet water year types will be developed based on the results of CalSim2 modeling.

## Hydrology Model

Reclamation has selected CalSim2 planning model for the Cost Allocation Study. CalSim2 uses historic hydrology adjusted to reflect a consistent level of land use, current facilities, simulated current regulatory environments, and is able to consider climate change impacts on water supply as an important sensitivity analysis.

## Water Supply Deliveries

Future water deliveries will be estimated by the CalSim2 model, which reflects multipurpose project operations under a consistent set of regulations and facilities. Historic water supplies will be based on actual deliveries based on records maintained by Reclamation.

## Capital Cost Evaluation: Methodology

The capitalized costs for each facility need to be equated to a common base year for comparison with facility benefits. There are two alternative cost equalization methodologies available for use in the Cost Allocation Study: (1) indexing and (2) re-pricing. Either method can be used to equate capital costs to a common base year required as part of the SCRB analysis, but each method has strengths and weaknesses that must be considered.

## Capital Costs: Types of Costs

Capital costs are categorized as Specific Costs, Separable Costs, or Joint Costs. Specific Costs relate to a single purpose facility. Separable Costs are part of a multi-purpose facility, but can be individually defined based upon a minimum allocation to the associated single purpose or function. Joint costs are those costs that remain in a multi-purpose facility after all separable costs are deducted.

Separable Costs will be itemized and determined utilizing Appraisal Level cost estimating methods, which are derived from engineering models, quantity take-offs and comparison.

## Facility Sizing

A database of existing facility costs will be developed using Bid Abstracts to identify major bid items and pricing. Costs for each CVP facility will be linked to major bid items in order to establish ratios and develop a computer-generated model of the existing facility for future sizing manipulation. Once the single purpose alternative sizing is determined (based on the benefits analysis for each project purpose), the facility will be re-sized with the computer model and material quantities extracted for re-pricing or indexing (depending on the approach selected). Appraisal-level cost estimates can be completed by applying the original facility pricing to new facility sizes and indexing as appropriate.

## Inclusion of New Melones Project

The New Melones project was authorized by PL 87-874 in 1962 for construction by the USACE with the provision that upon completion, the project would be operationally and financially integrated into the CVP. In 1980, the project costs were transferred to the CVP when the facility was placed in service, and Reclamation has been using the USACE cost allocation since that time. Reclamation has concluded that pursuant to PL 87-874, when the project was transferred to Reclamation, responsibility for performing the cost allocation was also transferred from the USACE to Reclamation. However, there is no governing authority precluding Reclamation from incorporating the facility into the final CVP cost allocation.

## Trinity River: Key Assumptions

Flood control and navigation are not authorized for the Trinity River Division and any benefits that accrue to flood control or navigation are incidental to its primary operation for fishery flows, recreation, irrigation deliveries, and power generation. Therefore, the Cost Allocation Study will not allocate any construction costs of the Trinity River Division to the flood control or navigation purpose.

## Flood Control: Benefits-Methodology

Flood control benefit values are characterized by “damages prevented” for each reservoir. The USACE completed flood control benefit analyses for each reservoir by indexing historic damages prevented values forward to the base year (2010). The USACE data have not been updated in several years; therefore, the property values reflected in the damages prevented analysis are considered very conservative. The effect of reservoir operations on downstream flow (damages prevented) is determined by routing and comparing regulated and unregulated (i.e. natural or without-project) river stages for selected sites. This involves comparing observed flows and damages occurring with the flood reduction facility to unregulated flows and the potential resulting damages. The reduction in river stage or flow resulting from reservoir operations is used to index the value of damages prevented. Given that flood control benefit values for the CVP have historically been significantly higher than the single purpose flood control facility cost, Reclamation will assume that the benefits still exceed the single purpose cost for the SCRB analysis.

## Flood Control: Benefits-Results

The flood control analysis completed by the USACE for the CVP Cost Allocation Study indicates that the value of historical flood control benefits generated by the CVP is an estimated \$37.7 billion (nominal or historic dollars). This value will be indexed to base year dollars and compared to the cost of a single-purpose flood control alternative. The nominal benefits are greater than the cost of the entire CVP; therefore, no further economic benefits analysis is needed; the single-purpose flood control alternative cost is the maximum justifiable expenditure and will be the controlling parameter in the allocation of joint costs to flood control.

## Flood Control: Facility Sizing

The general approach is to resize each existing reservoir as a stand-alone flood control facility based on USACE Flood Control Rule Curve requirements. The Flood Control Rules for maximum allowable storage are used in the CalSim2 planning model. Reclamation will examine the time series of rules used, and find the difference between the lowest number in the data set and the actual size of the reservoir which will equal the space or size required to accommodate inflows. This is the size of the reservoir that would be required if its only purpose was to provide flood control benefits.

## Navigation: Benefits-Methodology

Over the years, there have been the following correspondence between Reclamation and USACE regarding navigation benefits:

- In a 1987 USACE letter to Reclamation, navigation benefits were indexed from a 1959 estimate, and therefore, it is likely that minimal navigation benefits were occurring at that time.
- According to a letter from Reclamation to the USACE, dated June 3, 2013, the CVP has little, if any, effect on the navigation of ocean-going ships calling at the ports of West Sacramento and Stockton. As a result, the Cost Allocation Study will not allocate any construction costs of the CVP to navigation. These costs will be allocated among the other project purposes of the CVP.
- A revised letter (pending release) from Reclamation to USACE that corrects the June 3, 2013 letter, states that the Cost Allocation Study will not include an estimate of future navigation benefits generated by the CVP. However, costs allocated to navigation will be based on the present value of historic benefit values indexed to base year (2010) or the cost of a single-purpose project capable of providing the same level of benefits for navigation as the multi-purpose project. Lastly, pending the release of the revised letter, USACE concurs with Reclamation on the methodology used for navigation benefits.

## Navigation: Benefits-Results

To be estimated

## Navigation: Facility Sizing

Because USACE and Reclamation have determined that the CVP no longer provides navigation benefits, there is no need to develop single-purpose alternative costs.

## Irrigation Water Supply: Benefits-Methodology

Irrigation water supply benefits will be based on an economic analysis using the Statewide Agricultural Production Model (SWAP). SWAP optimizes crop acreage by projecting future cropping patterns, land use, and water use by considering land and water availability and cost, market conditions, and production costs. The model selects those crops, acreage and water supplies that maximize profit subject to certain constraints. SWAP is an agricultural crop acreage model that simulates the decisions of agricultural producers (farmers) on a regional level based on principles of economic optimization.

SWAP is well suited to estimate future irrigation water supply benefits. If the value of a 50-year projection of benefits does not exceed the cost of the single-purpose alternative, historic benefits may need to be estimated. In this case, alternative modeling approaches may be used, including the Farm Budget approach in accordance with the procedures described in the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G's). As stated in the P&G's, irrigation benefits are the value of increases in the agricultural output of the nation and/or the cost savings in maintaining a given level of output. The value of increases in agricultural output can be measured in a farm budget analysis as an increase in net farm income. Cost savings can be measured through increased production efficiencies and reduced production costs.

The benefits associated with irrigation water supplies are essentially the additional net farm revenues that result from the application of irrigation water to agricultural lands. SWAP (or the Farm Budget approach) will be used to estimate the value of an irrigation water supply to produce crops by estimating the residual net farm income of a representative farm in a project area with irrigation compared to residual income without irrigation.

## Irrigation Water Supply: Benefits-Results

To be estimated



## Irrigation Water Supply: Facility Sizing

Water supply benefits and single purpose alternative (SPA) facility sizing are based on water deliveries achieved with the multipurpose project. Water deliveries will be defined by CalSim2 model results which reflect multipurpose project operations under a consistent set of regulations and facilities rather than historical delivery levels which have varied over time due to changing criteria and system configurations. The following steps are required to analyze SPA facility sizes for water supply:

Reclamation will construct a "Cost Allocation CalSim2" (CalSim2) model with the single purpose of meeting project deliveries which are fixed to those under the current regulatory environment. The model will determine the reservoir sizes required to facilitate deliveries. The effects of regulations and other project operations are implicitly captured in the level of delivery that is met. Isolating the delivery purpose and operating theoretical storage facilities to meet only this purpose provides the single purpose facility sizes. To ensure a least-cost approach, the study will also consider the possibility that a different combination/mix of reservoirs may yield a more economical single-purpose alternative.

CalSim2 model runs can also provide a range of analysis options, including:

- Unique categories of delivery, such as irrigation and M&I
- Varying relative sizes of project reservoirs
- Effects of regulatory environment
- Effects of climate change
- SPA facilities could be sized for delivery levels achieved under D-1485, CVPIA, and D-1641.

## M&I Water Supply: Benefits-Methodology

Several distinct approaches are being considered to estimate M&I water supply benefits.

**Demand Curve Approach:** The California Municipal Demand Model (CMDM) will be used to estimate benefits on a per acre-foot basis. The municipalities that are included in the model are Contra Costa Water District, Eastern Municipal Water District, Irvine Ranch Water District, Los Angeles Department of Water and Power, Otay Water District, East Bay Municipal Water District, Western Municipal Water District, Carlsbad Municipal Water District, San Juan Capistrano.

**Cost Minimization:** The LCPSIM and OMWEM models attempt to minimize the costs of unreliability (foregone use) and the costs of reliability enhancement (demand reduction and supply augmentation).

Once benefit values are estimated for M&I water supplies based on demand curve analyses and/or cost minimization analyses, these values will be considered in conjunction with M&I water supply estimates provided by CalSim2 (for future deliveries) and/or historical data if needed to quantify total benefits.

## M&I Water Supply: Benefits-Results

To be estimated

## M&I Water Supply: Facility Sizing

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- SPA facilities could be sized for delivery levels achieved under D-1485, CVPIA, and D-1641.

## Refuge Water Supply: Benefits-Methodology

Refuge water deliveries per acre foot will be valued based on the "foregone value" associated with the most likely alternative use of the water (i.e., agriculture).

Future annual refuge water supplies from the hydrology modeling and possibly historical annual refuge water supplies would be multiplied by recent (adjusted to 2010) values per acre foot from the agricultural analysis to reflect the value of the most likely forgone use.

## Refuge Water Supply: Benefits-Results

To be estimated

## Refuge Water Supply: Facility Sizing

Water supply benefits and single purpose alternative (SPA) facility sizing are based on water deliveries achieved with the multipurpose project. Water deliveries will be defined by CalSim2 model results which reflect multipurpose project operations under a consistent set of regulations and facilities rather than historical delivery levels which have varied over time due to changing criteria and system configurations. The following steps are required to analyze SPA facility sizes for water supply:

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- Effects of regulatory environment
- Effects of climate change
- SPA facilities could be sized for delivery levels achieved under D-1485, CVPIA, and D-1641.

## Power: Benefits-Methodology

The benefit analysis for power will either be based on: (1) a with and without the CVP approach, or (2) future power market price approach. The first approach is a traditional approach for Reclamation. The second was suggested by some CVP contractors. To determine if the second

is an appropriate approach, a Proof of Concept Test will be conducted. If the Proof of Concept indicates that both approaches provide comparable results, then Reclamation will use the more streamlined second approach to value CVP power benefits.

The Proof of Concept entails estimating the benefits of CVP hydropower through a direct calculation of power accomplishments multiplied by forecasted market prices. The recommended simplifying methodology is to simply use a forecast of market prices, for year 2020 conditions when: (1) the Renewable Portfolio Standard mandate requiring 33 percent of load to be met from renewable resources will have been implemented, and (2) the Cap and Trade greenhouse gas emissions offset market will be mature and apply these prices, as appropriate, to forecasted CVP generation and ancillary services as constrained by the CVP's physical and regulatory operating constraints. The Proof of Concept tests the hypothesis that electricity market prices with and without the CVP are not significantly different than the streamlined approach. If that hypothesis cannot be validated, the power benefits evaluation will be completed using the with- and without-project approach.

Reclamation has contracted with Pinnacle Consulting LLC and Energy Exemplar to perform power benefits analyses and validate the results for a number of planning studies and the CVP Cost Allocation Study using the PLEXOS model. The PLEXOS model dynamically simulates the market dispatch of generation to meet load and reserve requirements while respecting transmission constraints to estimate the price of the resource being evaluated (in this case, the CVP hydropower system). PLEXOS is particularly good at modeling hourly hydro dispatch constrained by water operations and regulatory requirements. In addition, PLEXOS allows future benefits to be evaluated considering load growth, market dynamics and generation additions needed to meet legislative mandates.

## Power: Benefits-Results

To be estimated

## Power: Facility Sizing

Because hydropower generation is dependent on the available flow and head on the various river systems where current CVP facilities are located, it is assumed that each SPA power feature will be constructed at the same location as the current CVP facility. However, the size of the dam may be reduced and the length of the penstock increased to provide identical power benefits at least cost. The SPA will be sized as a dam, reservoir, and power plant system providing comparable power benefits to those associated with existing CVP power features (including on-peak, off-peak and ancillary service benefits). Comparable CVP capacity benefits

to be provided by the power SPA would be estimated using a dry-year analysis. To ensure a least-cost approach, the study will also consider the possibility that a different combination/mix of reservoirs may yield a more economical single-purpose alternative.

The costs of CVP transmission facilities to the principal points of delivery in the CVP will be considered as costs to be allocated. At a minimum, it would be desirable to include the cost of high voltage transmission to the Tracy load center independent of whether such facilities are owned by Reclamation or Western. The benefits to be replaced by the SPA are those associated with the gross production of CVP power rather than the net production of power after project use is subtracted. Separable and joint costs assigned to the power function will be sub-allocated to project use and commercial power.

## Fish & Wildlife: Benefits-Methodology

During the last attempt to update the CVP cost allocation study, U.S. Fish and Wildlife Service (FWS) did not participate in the study, but stated that it is probably inappropriate to assign any project costs to fish and wildlife purposes considering the negative impact that the CVP has had on fish and wildlife. After fish and wildlife losses associated with the CVP have been compensated for, it will be appropriate to begin assigning enhancement benefits to fish and wildlife.

For this study, Reclamation has been coordinating with FWS on the issue of fish and wildlife benefits. Initial meetings between FWS and Reclamation staff have not resulted in definitive decisions as to the issue of mitigation versus enhancement with respect to fish and wildlife resources (e.g., fish species) significantly affected by CVP facilities. If fish and wildlife resources are being mitigated, there would be no valuation of benefits. If the fish and wildlife resources are being enhanced by the CVP, fish and wildlife benefits would exist, and therefore, would require estimation using a benefits-transfer process. Benefits transfer makes use of valuation results from existing research when estimating benefits for the resource of interest.

The benefits transfer based valuation process would involve applying annual estimates of fish and wildlife enhancement populations as obtained from the U.S. Fish and Wildlife Service to economic use values (e.g., commercial, recreational, etc.) per fish as obtained from existing literature.

Costs allocated in the 1975 cost allocation study for facilities (e.g., Tehama-Colusa Fish Facility) which were constructed at the request of FWS for the purpose of enhancing fish and wildlife resources will be transferred to this Cost Allocation Study as enhancement and not reassigned or reallocated to other purposes.

## Fish & Wildlife: Benefits-Results

To be estimated

## Fish & Wildlife: Facility Sizing

To be developed

## Water Quality: Benefits-Methodology

To be developed.

Below is pertinent background information related to water quality benefits:

The CVP maintains increased flows in the Trinity, American, and Stanislaus rivers to improve the fisheries habitat and water quality conditions. Flow conditions in the lower reaches of the Trinity, American, and Stanislaus rivers are maintained under flow requirements set by the California State Water Resources Control Board (SWRCB). These costs are generally embedded in the costs of operating and maintaining the CVP, and for the most part, reimbursed by the authorized water and power beneficiaries. The costs of providing increased flows in the Stanislaus River however, are deemed non-reimbursable and assigned to the water quality purpose for the New Melones Unit.

The CVP is currently responsible for meeting its share of the salinity outflow standards set for the Sacramento-San Joaquin Delta. The standards are included in the SWRCB Water Rights Decision 1485 (D-1485) and Decision 1641 (D-1641). The costs of meeting D-1485 water quality standards are reimbursable by water and power contractors. Public Law 99-546, Section 102 (c) (1) dated October 27, 1986, states "the costs for providing water for salinity control and for complying with State water quality standards above those standards identified in the previous sentence (D-1485) shall be non-reimbursable." Meeting D-1641 water quality standards requires exceeding those of D-1485, meaning that any additional costs incurred by Reclamation in meeting D-1641 would be non-reimbursable. Reclamation is researching whether it was the intent of Congress in passing PL 99-546 that the added cost of complying with water quality standards higher than D-1485 would also be non-reimbursable. If this was the intent of Congress, then an appropriate share of project costs would be allocated to a non-reimbursable water quality purpose. It is recognized that the CVP provides additional water quality benefits during critically dry years. Reclamation is exploring options for evaluating these benefits that may be considered as water quality benefits.

## Water Quality: Benefits-Results

To be estimated

## Water Quality: Facility Sizing

To be developed

## Recreation: Benefits-Methodology

Based on Reclamation law and policy, and in the absence of specific authorizing legislation or the existence of a cost-sharing agreement, it is anticipated that no joint costs will be allocated to the recreation purpose for any multi-purpose CVP facilities.

The Federal Water Project Recreation Act of 1965 (FWPRA) authorizes project joint costs to be allocated to recreation, provided that Reclamation has an appropriate cost-share partner and agreement in place PRIOR TO project authorization (FWPRA, Sec. 2). It further requires, prior to project authorization, obtaining a commitment in writing from a non-Federal public entity to administer the project lands and water areas for recreation and to cost share on a portion of single-purpose recreation construction costs and at least half of all operating costs. Because these requirements have not been met, no joint costs will be allocated to the recreation purpose with the possible exception of the New Melones Unit.

Should the New Melones Unit qualify for a recreation allocation, recreation benefits would need to be estimated. To estimate recreation benefits, annual recreation visitation data would be collected and/or estimated. A benefits-transfer process would be employed to value the recreation benefits. Benefits transfer makes use of valuation results from existing research when estimating benefits for the resource of interest. Recreation benefits per visit obtained from existing literature would be applied to the annual visitation estimates.

## Recreation: Benefits-Results

To be estimated, if applicable

## Recreation: Facility Sizing

To be developed, if applicable

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